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eastwards from the Sea of Azov, along isotherm 22° C. (c. 71° F.) in July, while the winter-wheat area lies athwart the winds, parallel with the Black Sea coast, especially southeast of the Azov, *i. e.*, along isotherm—4° C. in January. The spring-wheat area is, therefore, associated with greater range of temperature (having an average of —10° C. in January), as also with greater variation of yield, this having varied from 58,000,000 cwts. in 1906 to 148,000,000 in 1913; and such variation helps to account for the excessive variation in price, which even at Odessa varies from 29 per cent. below normal to 32 per cent. above, while at Saratov it varies from 35 per cent. below to 62 per cent. above. Both areas have sudden increase of rainfall in May, then maximum in June-July, a dry autumn, and some increase of rain again in November or December. And it is, of course, the "temperate" winters that are bad for the winter wheat (p. 27)—in hard winters it seems to take no harm. In fact, wheat-growing is greatly facilitated by both soil and climate, but there are at present insuperable difficulties against introducing intensive culture, although the wheat area has—for Russia—quite a dense population (25 to 70 per square mile). In the absence of scientific agriculture, the result of this comparative density is that only sixteen governments, out of c. 70 in European Russia, have normally any surplus wheat for export; and this surplus is based on a per capita consumption of 150 pounds in 1913, as against 60 pounds in 1906. Still, cereals make two thirds of the total value of Russian exports, wheat having over one third of the total cereal value. The transport is by both water and rail, the useful "floatage" being estimated at c. 90,000 miles and the navigable water at c. 28,000 (excluding Finland), and an annual duration varying from an average of 263 days (with a range of 50) on the Dnieper, to one of 231 days (with a range of 29) on the Don, and one of 223 (with a range of 67) on the Lower Volga. The statistical returns emphasize in the most marked way the insignificance of Odessa as a wheat port. For some years it has never been in the list of the first

six. It is generally far behind its two neighbors of the Dnieper liman, Kherson and Nicolaiev—the latter, as an important railway junction on the only line to Kherson and with a much wider river, having the steadier trade of the two. All three together were not equal to Rostov in 1913, with its 17 per cent. of the total Russian export, while even Riga is usually at least as important as Odessa. The sheltered "Riviera" port of Novorossiskaya, the terminus of the Volga line from Tsaritsin, comes next to Rostov, with c. 9 per cent. of the total export and has a very steady trade; and Taganrog usually stands third, though large quantities of wheat are exported from other Azov ports, *e. g.*, Yessk, Berdiansk, Mariupol and Feodosia—which really counts as an Azov port. Altogether, c. 45 per cent. of Russian wheat exports go from the Azov, the Black Sea proper having only c. 40 per cent.; and the quantity in millions of pounds roughly approaches the value in millions of roubles (203 and 225 in 1913). For years before the war Russia had furnished Switzerland with her chief supplies of wheat, though by 1912 the proportion had fallen slightly below 50 per cent., while it was only 36 per cent. in 1913. The grain moved via Genoa or Marseilles or Mannheim, some going on as far as Strassburg or Kehl; and the manipulation of dues on the German railways was such that, though the water rate to Mannheim was c. 1,400 francs per quintal as against 800 to Genoa or Marseilles, the total cost to Berne was only c. 3,200 francs as against 3,070 via Genoa and 3,300 via Marseilles. The saving to Zurich was 300 francs greater. The extra time for delivery to Switzerland via the Rhine was 20 days.

THE SUPPRESSION OF BODY-VERMIN

A COMPREHENSIVE paper entitled "Combatting Lousiness among Soldiers and Civilians," by Professor G. H. L. Nuttall, appears in *Parasitology* for May. According to an abstract in *Nature*, the paper is one of a series which when complete, will constitute an exhaustive monograph on human lice. It brings together, not only the available published

information, but also that resulting from hitherto unpublished research work, partly the author's own, and partly that of others contained in reports to the War Office, which he has been permitted to use. Professor Nuttall has generously presented a special edition of three hundred copies of the paper to the Allied Armies; and, in view of the recently established fact that the trench fever is conveyed by lice, this should prove a very timely gift.

The paper comprises 176 pages, with four plates and twenty-six figures in the text. Most of the pages are devoted to the practical consideration of louse destruction a great deal of the experimental evidence being given in detail. The results obtained demonstrate that nits are killed by dry heat at 65°-70° C. in one minute, and at 55°-61° C. in ten minutes, the active stages being killed by dry heat at 65°-70° C. in one minute and at 55° C. in five minutes. After allowing for a margin of safety in practise, immersion in hot water at 70° C. for a minute or two is amply sufficient to destroy lice, while 55° C. for ten minutes is equally effective, a point of great importance in relation to the washing of flannel garments.

Singeing, sun-baking, and the use of hot flat-irons are briefly dealt with. The various methods devised for disinfection by hot air and steam are treated of at length, and illustrated by text figures of disinfectors improvised for war purposes, together with plates depicting the more elaborate forms of disinfectors designed for use in peace time. We agree with the author that apparatus designed with a view to high efficiency against the resistive spores of bacteria is not adapted for rapid and economical use against lice. It should be replaced by more commodious hot-air and steam huts, or disinfectors planned on the improvised railway vans said to have been so successful in the east. Designs of this type of chamber should also be adapted for steam or motor lorries, as well as trailers, which could, if necessary, be horse-drawn.

Steam gives results superior to hot air if the destruction of pathogenic bacteria is an object, but dry heat possesses many advantages

over steam if the destruction of body vermin is the end in view. The use of sulphur is treated of at some length. We endorse the author's remarks as to the failure of sulphur vapor to destroy all the nits exposed to it, while its relatively high cost, the danger of injury to clothing and its slow action are further disabilities of the method.

In the section dealing with insecticides and so-called repellents, the results of the great mass of experimental work are tabulated in detail, an unavoidable course owing to the wide diversity of method employed by the various workers. In these experiments lice and nits were immersed in, brought into contact with, and submitted to the action of the vapor of various substances and preparations.

THE FUR SEALS OF THE PRIBILOF ISLANDS

In the present calendar year to August 10, the end of the regular killing season, 33,881 sealskins were taken at the Pribilof Islands. Of these, 7,000 were taken on St. George Island and 26,881 on St. Paul Island. The Department had authorized a take of 35,000 skins, 7,000 on St. George and 28,000 on St. Paul. Some few seals will be killed from time to time during the remainder of the year for the purpose of furnishing fresh meat for the natives.

By the terms of the North Pacific Sealing Convention of July 7, 1911, 15 per cent. of this year's take of skins belongs to the Canadian government and a like proportion to the Japanese government. There will be no actual delivery of these skins, but, under the provisions of the convention, the market value of the skins will be credited to the respective governments as an offset to certain advance payments made to them by the United States.

A census of fur seals on the Pribilof Islands was conducted by G. Dallas Hanna, and preliminary figures, subject to slight modification when all the data have been carefully examined, have been received. The number of pups born was 143,005, and the number of breeding cows was the same. The approximate total size of the Alaskan herd was 496,-